

THAT WHICH IS CLAIMED IS:

5 comprising the steps of:

splitting (455) the digital image into a plurality of blocks and calculating, for each block, a group of DCT coefficients for the components of each type,

10 quantizing (460-465) the DCT coefficients of
each block using a corresponding quantization table
scaled by a gain factor for achieving a target
compression factor,

characterized by the steps of
15 determining (440) at least one energy measure
of the digital image,

estimating (441-450) the gain factor as a function of the at least one energy measure, the function being determined experimentally according to the target compression factor.

5 the steps of:

10 energy measure, the first function being determined

experimentally according to the target compression factor,

calculating (442) a second number of bits required to encode the DC coefficients of all the
15 blocks using the quantization tables scaled by the pre-set factor,

estimating (443-445) a basic compression factor provided by the quantization tables scaled by the pre-set factor according to the first number of
20 bits and the second number of bits, and

estimating (450) the gain factor as a second function of the basic compression factor, the second function being determined experimentally according to the target compression factor.

3. The method (400) according to claim 2, wherein the first function is a linear function and the second function is a quadratic function.

4. The method (400) according to claim 2 or 3, wherein the step of estimating (443-445) the basic compression factor includes the steps of:

estimating (443) a third number of bits,
5 required to encode control values, according to the number of elements of the digital image,

calculating (445) the basic compression factor dividing the sum of the first, second and third number of bits by the number of elements of the digital
10 image.

5. The method (400) according to any claim from 2 to 4, further comprising the steps of:

09902439-071001

selecting (410) an image quality and
determining a current_value of the target_compression
factor as a function of the selected image quality,

6. The method (400) according to any claim from 2 to 5, wherein the pre-set factor is determined experimentally according to the target compression factor.

7. The method (400) according to any claim from 1 to 6, wherein each element of the digital image consists of a luminance component, a first chrominance component, and a second chrominance component.

8. The method (400) according to claim 7,
wherein the at least one energy measure consists of a
total energy measure equal to the sum of an energy
measure of the luminance components, an energy measure
of the first chrominance components and an energy
measure of the second chrominance components.

9. The method (400) according to claim 7 or 8, wherein the step (440) of determining the at least one energy measure comprises, for each type of component, the steps of:

5 calculating a horizontal Sobel image and a vertical Sobel image by means of a convolution of the elements of the digital image consisting of said type of component with a horizontal mask and a vertical mask, respectively,

10 calculating a total Sobel image by summing the horizontal Sobel image and the vertical Sobel image, and

summing the absolute value of each element of the total Sobel image.

10. The method (400) according to claim 9, wherein at least one quantization table is asymmetric along a horizontal direction and a vertical direction, the method further comprising the steps of:

5 multiplying the Sobel image associated with the at least one quantization table by a correction factor for compensating the asymmetry of the corresponding quantization table.

11. The method (400) according to any claim from 1 to 10, further comprising the steps of:

5 providing (410-430) an incomplete digital image wherein at least one component is missing in each element,

obtaining (435) the digital image from the incomplete digital image,

10 storing (438) the digital image onto a working memory and concurrently performing the steps of determining (440) the at least one energy measure and estimating (441-450) the gain factor,

reading (455-465) the digital image from the working memory for performing the steps of splitting

0900439-01001

(455) the digital image and quantizing (460-465) the
15 DCT coefficients.

12. The method (400a) according to any claim
from 1 to 10, further comprising the steps of:

providing (410-430) an incomplete digital
image wherein at least one component is missing in each
5 element,

obtaining (435) the digital image from the
incomplete digital image for performing the steps of
determining (440) the at least one energy measure and
estimating (441-450) the gain factor,

10 obtaining (435a) the digital image from the
incomplete digital image again for performing the steps
of splitting (455) the digital image and quantizing
(460-465) the DCT coefficients.

13. A device (115) for compressing a digital
image including a matrix of elements each one
consisting of a plurality of digital components of
different type representing a pixel, the device (115)
5 comprising means (145) for splitting the digital image
into a plurality of blocks and calculating, for each
block, a group of DCT coefficients for the components
of each type, means (150) for quantizing the DCT
coefficients of each block using a corresponding
10 quantization table scaled by a gain factor for
achieving a target compression factor,

characterized in that

the device (115) further includes means (190)
for determining at least one energy measure of the
15 digital image, and means (170) for estimating the gain
factor as a function of the at least one energy

09002439 071004
FOOT 20 6E420660

-33-

on being determined expected target compression factor.

device (115) according to a compression unit (135) splitting the digital image into coefficients and the mean DCT coefficients, a memory for the quantization tables, and the means for determining the measure, a processor unit (115), a communication unit, the memory, the processor unit there (170) estimating the gain of a program stored onto the digital still camera (100) and providing the digital image in 13 or 14.

means for d
a process
(5), commun
ssion unit,
rocessor un
estimating
ogram store

add
21